

Chapter 7. Summary

DWR began the North of the Delta Offstream Storage Investigation in late 1997 as a two-year reconnaissance-level study authorized by Proposition 204, the Safe, Clean, Reliable Water Supply Act, approved by voters in 1996. In early 1999, CALFED consolidated all storage investigations under a comprehensive program called the Integrated Storage Investigations. The North of the Delta Offstream Storage Investigation was incorporated into one of seven ISI program elements and continues engineering, economic, and environmental impact analyses to determine the feasibility of four north of the Delta storage projects.

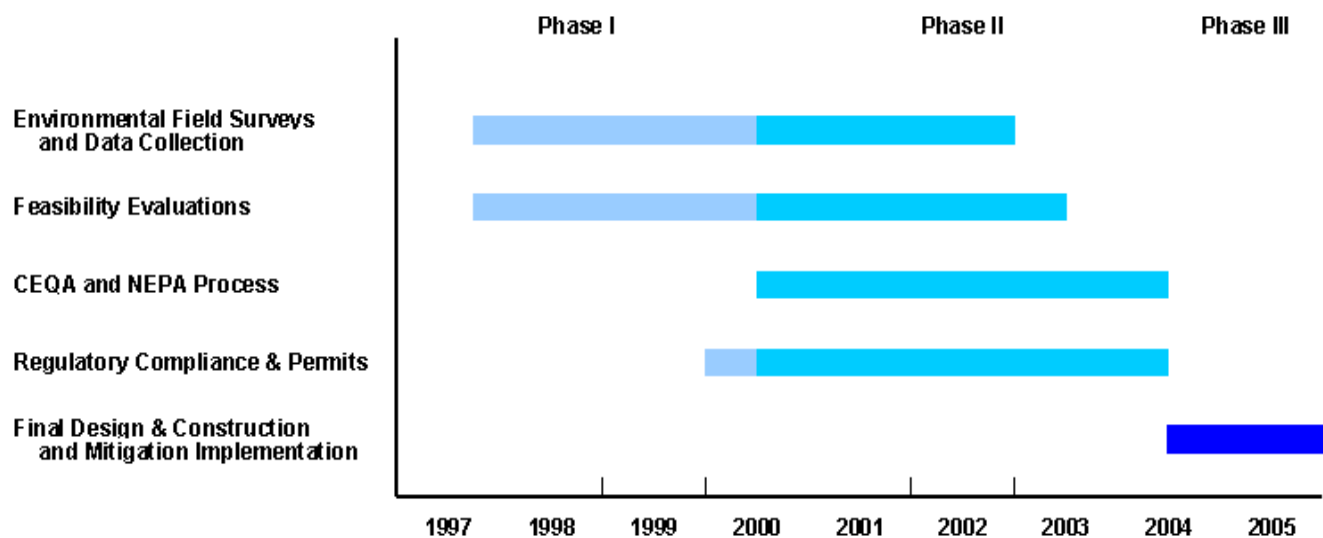
Phase I of this investigation, currently under way, includes preliminary field surveys of environmental and cultural resources; geological, seismic and foundation studies; and engineering feasibility evaluation. Phase II will start when CALFED's Record of Decision and Certification for the Programmatic EIR/EIS is filed, and if additional north of the Delta offstream storage is consistent with CALFED's preferred program alternative. Phase II will include completing the necessary fish and wildlife surveys, evaluating potential mitigation sites, preparing project-specific environmental documentation, completing a final project feasibility report, and acquiring permits necessary for project implementation. Phase III will consist of final design and construction, and mitigation plan implementation contingent on findings of Phase II investigations. Figure 7-1 shows the project timeline. A more detailed workplan is shown in Figure 1-2.

Phase I studies are designed to:

- Collect field data to identify any potential fatal flaws in any of the project alternatives;
- Provide necessary field data for project feasibility evaluation;
- Gather information that will help the decision-makers to formulate a preferred alternative for the North of the Delta Offstream Storage Program; and
- Provide field data for environmental documentation process, Habitat Evaluation Procedure, mitigation planning, and regulatory agencies' permit decisions.

Studies conducted in Phase I will be valuable in the decision-making process of choosing a preferred alternative project and in helping to formulate a plan for the North of the Delta Offstream Storage Program in an environmentally sensitive manner. Phase I studies have also provided basic information on the costs, benefits, and potential impacts of north of the Delta offstream storage for consideration in CALFED's programmatic EIR/EIS.

Figure 7-1. North of Delta Offstream Storage Investigation Timeline



Engineering studies conducted in the last two years focused on identifying major project features and alternative sources of water supply. Water supply studies; alternative conveyance facilities; geological exploration of dam sites; and initial design of dams, spillways, canals, stream diversions, pumping plants, and power generation facilities for Sites Reservoir have been the main activities. The following is a list of completed principal engineering activities:

- Preliminary hydrology and operation studies for each reservoir;
- Preliminary fault and seismic evaluation for the four project alternatives ;
- Preliminary design work for conveyance facilities to Sites Reservoir;
- Preliminary cost estimates for various conveyance alternatives;
- Aerial photography and topographic mapping, including 2-foot contour mapping at Sites and Golden Gate Dam sites, and conveyance alignments;
- Preliminary evaluation of embankment dam cross sections for Sites Reservoir;
- Preliminary design and cost estimates for dams and appurtenances at the Golden Gate Dam site;
- Location and characteristics of dam construction materials for Sites Reservoir;
- Preliminary design and cost estimates for pumping/generating facilities from Funks Reservoir to Sites Reservoir;
- Preliminary road and utilities relocations study for Sites and Colusa Reservoirs;

- Foundation mapping, drilling, and water pressure testing for Sites Reservoir and partial Colusa Project; and
- Initial detailed fault and seismic evaluation of Sites Reservoir.

Biological studies were initiated to identify endangered, threatened, or sensitive plant and wildlife species that exist within the reservoir inundation areas, along with cultural resources studies. These studies consisted of reviewing past studies and existing databases, and conducting field surveys. Environmental activities completed to date include:

- Delineation of all wetlands in all reservoir areas;
- Preliminary cultural resources inventory of all reservoir areas;
- Complete two-year botanical survey of all reservoir areas ;
- Complete survey of elderberry plants in all reservoir areas ;
- Complete two-year survey of threatened and endangered species in reservoir areas (Amphibian and reptile surveys were not conducted at Thomes-Newville Project area in the current efforts.) ;
- Survey of general species and their habitat as needed to begin the Habitat Evaluation Procedure;
- Fairy shrimp habitat survey and mapping for Thomes-Newville and Sites and Colusa Reservoir areas; and
- Preliminary evaluation of recreational facilities potential for Sites Reservoir.

Reconnaissance-level surveys for potential special-status shrimp habitat at the potential reservoir sites were performed using aerial photography and existing data. DWR is initiating a process to work with USFWS and affected landowners to obtain incidental take permits and right-of-entry permits, respectively, to conduct shrimp surveys using service protocol at the project areas. In addition to the shrimp surveys, environmental studies in Phase II will be extended to include areas outside of the reservoir footprint for project alternatives, along the alignment of conveyance facilities, and where other infrastructures associated with the project, including future road and recreation facilities, will be located.

Impacts of diversion from the Sacramento River on the ecosystem and fishery resources have been the subject of extended discussion. A series of studies to evaluate the potential impacts of project operation on fishery, riverine processes, and overall Sacramento River ecosystem is being initiated and will continue during the next two years. The following is a list of studies planned for this program. Work on some of these studies has begun and will continue during Phase II. Work has begun on these activities:

- Establish a process for proper coordination and consultation with resource agencies;
- Complete operation studies for project alternatives;
- Complete water quality investigation for project alternatives;
- Complete amphibian and reptile surveys;
- Complete tributaries fish studies for project alternatives;
- Complete highway and utilities relocation studies for project alternatives;

- Complete recreation facility design for project alternatives;
- Complete Sites and Golden Gate Dams design and cost estimates;
- Complete geological investigation for Sites Reservoir including foundation and borrow materials investigation;
- Complete fault and seismic analysis for Sites Reservoir;
- Develop a water exchange program for project alternatives; and
- Evaluate impacts of diversions on Sacramento River ecosystem.

Work on these activities will begin in mid-2000:

- Energy analysis and power transmission facilities for project alternatives;
- Evaluate impact of diversions on Sacramento River fishery resources;
- Initiate special status shrimp surveys for project alternatives;
- Initiate and complete the following studies outside the footprint of the Sites Reservoir: avian, wetlands, botanical resources, mammals, fish, amphibians, reptiles, and valley elderberry longhorn beetle;
- Conveyance facilities design and cost estimates for Sites and Colusa Projects;
- Embankment design and cost estimates for Golden Gate, Sites, and saddle dams;
- Update Newville Dam design and cost estimates;
- Update Newville Dam geological investigation, including borrow materials and foundation investigation;
- Update embankment design and cost estimates for Newville Dam and saddle dams;
- Update Newville Dam fault and seismic analysis;
- Complete conveyance facilities for Thomas-Newville Project;
- Develop project formulation;
- Complete CEQA and NEPA process;
- Complete Habitat Evaluation Procedure;
- Prepare mitigation plans;
- Acquire project permits;
- Complete economic feasibility of the project alternatives;
- Final engineering feasibility; and
- Complete general mammal surveys.

The Phase II investigations will culminate in preparation of environmental documents to comply with NEPA and CEQA. NEPA directs federal agencies to prepare an environmental impact statement for all major federal actions that may have a significant effect on the human environment. CEQA, modeled after NEPA, requires California public agency decision-makers to document and consider the environmental impacts of their actions. It requires an agency to

identify ways to avoid or reduce environmental damage and to implement those measures where feasible.

In addition to environmental documentation, water project sponsors must comply with various laws protecting waters and wetlands as well as other aspects of the environment. The following is a list of major federal and State environmental permits and compliances that may be needed for project implementation.

Federal

- Section 404 of the Clean Water Act Permit for reservoir, conveyance system, and diversion structure
- Federal Endangered Species Act Compliance-Section 7 Take Permits
- National Environmental Protection Act Compliance
- Federal Energy Regulatory Commission Compliance
- National Historic Preservation Act Compliance
- Fish and Wildlife Coordination Act
- Rivers and Harbors Act Compliance
- Farmland Protection Act Compliance
- Executive Order 11988: Floodplain Management Compliance
- Executive Order 11990: Protection of Wetlands
- Clean Air Act Compliance
- Surface Mining Reclamation Act Compliance

State

- Regional Water Quality Control Board 401 Water Quality Certification
- Regional Water Quality Control Board Stormwater Permit
- Regional Water Quality Control Board Approval for Construction in Water Bodies and Discharge of Dewatering Water
- State Water Resources Control Board Water Rights Permits
- Department of Fish and Game 1600 Streambed Alteration Agreement
- Department of Fish and Game Dredge Permit (Section 5653 DFG Code)
- California Environmental Quality Act Compliance
- State Endangered Species Act Compliance
- Department of Water Resources Dam Safety Certification
- State Lands Commission Notification/Permit (Riverbed Modification)

The studies that have been conducted in the last two years have provided valuable engineering and biological data to the North of the Delta Offstream Storage Investigation. These studies, along with the work completed during the next several years, will be instrumental in the decision-making process, compliance with CEQA and NEPA, and mitigation planning for the preferred alternative for north of the Delta offstream storage. The previous chapters in this

progress report have summarized the work that has been completed. The following section lists the findings and makes some recommendations as the program moves forward.

Findings and Recommendations:

- Four offstream storage alternatives are under investigation in the west side of the Sacramento Valley. Project formulation includes consideration of a water exchange program to use the water supply from the project for agricultural and wetland uses within the Colusa Basin in lieu of equivalent diversions from the Sacramento River.
- North of the Delta offstream storage can improve water supply reliability. Potential project benefits include increased operational flexibility; improved water quality; reduced flooding; additional water supply to meet agricultural, urban, and environmental demands; cooler water for Sacramento River salmon; and ecosystem benefits.
- Engineering and geologic investigations conducted at Golden Gate and Sites Dam sites indicate that these sites are suitable for construction of dams impounding a 1.8 maf Sites Reservoir.
- The dominant Natural Plant Community in the Sites, Colusa, and Thomes-Newville Project areas is California annual grassland. The Red Bank Project area is dominated by blue oak, mixed oak, foothill pine, and chaparral. Sites Reservoir contains a greater diversity of habitat types than found in the Colusa Cell. Thomes-Newville Project area has more habitat diversity than Sites Reservoir. Red Bank Project area, by far, has the most habitat diversity of the four.
- Habitat for the valley elderberry longhorn beetle occurs at each of the four proposed reservoir sites. VELB emergence holes were found within the proposed Sites and Newville Reservoir areas. No emergence holes were found within the proposed Colusa Cell and Red Bank Project areas. No adult beetles were observed at any of the proposed reservoir sites.
- Jurisdictional wetlands and waters of the U.S. are present in all four reservoir areas. The Newville Reservoir area with 413 acres of jurisdictional wetlands and 231 acres of other waters of U.S. has the most acreage of all four reservoir areas.
- Review of existing databases indicated that nine State and federally listed avian species could be found within the counties covering the west side of the Sacramento Valley and foothills. Three of these species were identified during field surveys, including sporadic wintering use by both adult and immature bald eagles, which have been documented at each of the four reservoir sites. A single sighting of a bank swallow was made near the proposed Colusa site. Five sandhill cranes were observed flying over the Colusa Project area during November 1997. This observation occurred on a foggy day in the Sacramento Valley when the sandhill cranes may have flown over the project area in the foothills which were fog-free to use the annual grasslands.

- The streams flowing through the proposed Sites Reservoir and Colusa Cell are warm water streams with poor water quality. These streams do not support habitat for anadromous fish and are generally intermittent in nature. Sampling of game and nongame fishes within these streams found very few fish above 6 inches long, suggesting that fish only rear in these areas. Hitch are the most abundant fish found in both reservoir areas.
- Thomes Creek was surveyed in 1980-81, 1981-82, and again in 1999 for the presence of salmon and steelhead. Fall and late fall-runs of salmon and steelhead were seen during these surveys. In the 1999 survey, one adult spring-run chinook salmon was found.
- DFG staff estimates that Cottonwood Creek supports a good population of steelhead. Steelhead were found in Red Bank Creek within the footprint of Schoenfield Reservoir. Fall-run and late fall-run chinook salmon were found by DFG staff in lower Cottonwood Creek from the mouth to the confluence of North Fork Cottonwood Creek. Spring-run chinook salmon migrate upstream in April and spend the summer in deep pools in South and North Fork Cottonwood Creek.
- No threatened or endangered amphibians were found within the Sites, Colusa, or Thomes-Newville Project areas. A California red-legged frog was found in the Red Bank Project area. (Amphibian surveys were not conducted at the Thomes-Newville Project area during the current efforts. Findings for the Thomes-Newville Project were from studies conducted in the early 1980s.)
- Fish species found in Cottonwood Creek are more diverse than in streams flowing through other alternative reservoir sites. Spring-run chinook salmon and steelhead were sampled in South Fork Cottonwood Creek where the proposed Dippingvat Reservoir would be located. Much more diverse habitat and species were present within the Schoenfield Reservoir area.
- Hydrologic studies of Red Bank Creek indicate that without diversions from Cottonwood Creek (or other sources), Schoenfield Reservoir is not feasible. The natural flow of Red Bank Creek at the proposed Schoenfield Reservoir averages about 16 taf per year, not adequate to fill Schoenfield Reservoir without additional water supplies. Diversion of Cottonwood floodflow to Red Bank Project is not feasible without constructing a diversion dam on South Fork Cottonwood Creek, which is not favorable because of its diverse fish resources. Therefore, it is recommended that the Red Bank Project studies be discontinued.
- Red Bank Creek is proposed to convey Schoenfield Reservoir water to the Tehama-Colusa Canal. Seepage of project water in Red Bank Creek may be excessive, making it an infeasible conveyance alternative.
- The embankment to storage ratio for the Colusa Cell is high, increasing the project cost considerably. This is primarily due to the very large embankments required to construct four main dams and seven saddle dams that would form the Colusa Cell. This large embankment volume increases the cost of the project and the unit cost of water considerably. Therefore, further field studies of the Colusa Project should be deferred until the

completion of an economic feasibility study of the project. These studies may be continued later, if economic evaluations indicate that the Colusa Cell is feasible.

- The environmental documentation process for the North of the Delta Offstream Storage Project should start this year if additional north of the Delta offstream storage is consistent with CALFED's preferred program alternatives as discussed in the Bay-Delta Program final programmatic EIS/EIR and Record of Decision.